

## BIBLIOGRAPHICAL NOTICE.

*The Structure of Eozoon canadense compared with that of Foraminifera, by his own Investigations.* By Professor KARL MÖBIUS, Professor of Zoology at Kiel. 4to. Extracted from TH. FISCHER'S 'Palæontographica,' vol. xxv. (pp. 175-192, and plates 33-40), 1878.

[Der Bau des *Eozoon*, &c.]

THE author first enumerates the published memoirs on *Eozoon*, and states how he was led to look specially into the matter, having met with his *Carpenteria raphidodendron*, of Mauritius, which at first sight he thought would present some striking analogy to the presumed Laurentian fossil. The sources whence he obtained Eozoöal preparations and the methods of examination are also mentioned. The form and size of *Eozoon*, as recognized by Dawson and Carpenter, and their comparison of its structure with that of certain Foraminifera, are given in some detail; also the shape, size, and arrangement of the serpentine bodies ("chamber-casts," "concretions," &c.), their connexion, and the fibrous layer ("acicular crust," "nummuline layer," &c.) between these bodies and the limestone (calcite) are treated of as figured in the accompanying plates. The little Eozoöal stalk-like bodies traversing the associated limestone (calcite), and regarded by Eozoöologists as "casts of canals," are next dealt with (p. 185). The structure, as a whole, is compared with that of Foraminifera at pages 186-189. The absence of any primary or central chamber, the apparently capricious distribution of both the "tubuline layer" and the "canals," the impossibility of representing the *Eozoon* as a whole by any drawing of one natural specimen, and the consequent necessity of using diagrammatic figures to illustrate the reconstructed body, are points dwelt upon in this chapter, leading to Prof. Möbius's conclusion that he does not believe *Eozoon* to be a Foraminifer or organic at all.

At pages 189-191 the author refers to the brief published observations on *Eozoon* emanating from the lamented Max Schultze, who stated that he could not agree in the opinion that the so-called "nummuline layer" was really of Foraminiferous origin, and expressed his intention of giving further study to the other peculiar structure, which had been referred by Dawson and Carpenter to the "canal-system," and with specimens of which his friends were supplying him.

The reasons for referring the structure of Eozoöal marble to a Rhizopodal organism have been given in detail, with illustrations, in many papers and notes by Carpenter and Dawson in this and other periodicals. The objections now again raised by our author have been already dealt with in those papers. Of the structures treated of by Prof. Möbius the branching and lobular infillings of the "canal-system" are particularly valued by Eozoöologists as good evidence, on account of their peculiar arrangement, so agreeable to the disposition of canals in certain Foraminiferous shells. Such

appearances in *Calcarina* &c. were figured and published without reference to and before the discovery of *Eozoon*. That ancient organisms, though belonging to the same groups as are represented in nature to-day, should differ widely in details of structure, is a truism illustrated by many newly discovered fossil (and even recent) forms of life, whose structure is found to be wonderfully different from, and yet wonderfully consonant with, the make-up of the already known types of organic structure; and this invalidates our author's objection to a reliance on the possibilities of Nature. What zoologist or botanist can predicate the structural details of the next discovered plant or animal, however narrow the limits we may suppose to define its alliance to any previously known form?

Although many mineralogists regard the Eozoonal rock as having been as inorganic in its origin as it now is in its material, yet Dr. Sterry Hunt, for one, who has long studied it, thinks that its peculiarities are not due to a mineral genesis alone. We know also that not only Foraminiferal shells, but other calcareous tests and skeletons, both recent and fossil, have their tubes and cavities filled by various minerals, with results very similar to what is regarded as having taken place and as being visible in *Eozoon*.

It is not that here and there, and, indeed, in very many parts of a true Eozoonal rock there are lines and patches, fibrous and concretionary, of purely mineral origin, as well as their mineral matrix; the point to be kept in view is that the structure of certain portions is best explained by reference to mineral infiltration of tubular and cavernous shells, which grew and spread after the manner of Foraminifera, though not identical with any known form in particular. Also it has to be remembered that not only has the enclosing rock been itself subjected to mineral changes, but has been crushed, broken, and twisted, and that the scarcity of large areas of perfect and undisturbed structure, in such a relatively large Rhizopod, has to be supplemented, in the study of its whole, by such diagrammatic constructions of what the experienced observer recognizes and wishes to explain, as our author condemns at p. 188, because, he thinks, the Eozoonists in their diagrams have overstepped the line of probability. Without such illustrations, showing (like models) both the elevation and perspective of internal arrangements, we may remark, external appearance and microscopic sections would very imperfectly elucidate the descriptions of large Foraminifera. The correlation of the mineral representatives of at least the "canal-tubes" and "chambers" in *Eozoon*, both of which are cut at many different angles in sections, and can rarely be seen in elevation, and then only to a small extent, are best shown by this method—especially, too, as the student has, in this case, to make a mental translation of threads into tubes and nodules into chambers.

At page 198 Prof. Möbius consoles the Eozoonists with his opinion that the doctrine of evolution need not be despaired of because he removes the primordial *Eozoon* from the category of Beings. We do not see the value of this commonplace and wordy

little chapter, except to illustrate what (at pp. 178, 179) he warns Eozoonal and other naturalists to avoid, namely, time-wasting and immature talk, in which words take the place of ideas.

Plates xxiii. to xxxiv. inclusive contain carefully drawn figures (coloured) of preparations of the Eozoonal ophitic marble, as thin slices, as etched surfaces, and as separated particles, communicated by Drs. Carpenter and Dawson.

Plates xxxv. to xl. inclusive (excepting one figure) contain enlarged sections of the shell-structure of *Polytrema miniacum*, *Cycloclypeus*, *Nummulina*, *Calcarina Spengleri*, *Tinoporos baculatus*, *Orbitoides papyracea*, *Polystomella*, and *Carpenteria raphidodendron*. All (except one) of these drawings have been made by the Author himself.

In none of the preparations of known recent and fossil Foraminifera here figured does Prof. Möbius see any thing more than a very distant resemblance to Eozoonal structure, which latter, as before said, he regards as inorganic.

This memoir is a handy *résumé* of the objections made by anti-eozoonists to the presumed organic origin of the object under notice; and the plates brought together by Prof. Möbius, with no little labour and skill, are useful as a compendious set of sectional figures of *Eozoon* and many of its more modern relations; and though he fails to see their alliance, close as the analogies may be, yet his work is highly useful and praiseworthy; it is disinterested, straightforward, and conscientiously offered for the advancement of true knowledge.

T. R. J.

## PROCEEDINGS OF LEARNED SOCIETIES.

### GEOLOGICAL SOCIETY.

February 21, 1879.—Henry Clifton Sorby, Esq., F.R.S.,  
President, in the Chair.

The following communications were read:—

1. "Note on *Poikilopleuron Bucklandi*, of Eudes Deslongchamps (père), identifying it with *Megalosaurus Bucklandi*." By J. W. Hulke, Esq., F.R.S., F.G.S.

The author stated that the genus *Poikilopleuron* was founded by Deslongchamps, after much hesitation, to receive some Megalosauroid fossils found in a quarry near Caen, and that he gave them the specific name "*Bucklandi*," with the view of facilitating the union of the two genera, should this be found necessary. The author reviewed the evidence on which the genus *Poikilopleuron* rests, indicating the close resemblance of the remains to those of *Megalosaurus*, and showing that a medullary cavity exists in the vertebræ of the latter, thus getting rid of the most important difference between the two supposed genera. The author's conclusion was that *Poikilopleuron* and *Megalosaurus Bucklandi* were identical.

2. "Note on a Femur and a Humerus of a small Mammal from the Stonesfield Slate." By H. G. Seeley, Esq., F.L.S., F.G.S., Professor of Geography in King's College, London.

The author described a small femur and humerus preserved in slabs of Stonesfield Slate in the collection of the British Museum, to which they were presented many years ago by Mr. Pease Pratt. The bones nearly correspond in size; and, in the absence of evidence to the contrary, the author preferred to regard them as possibly belonging to the same animal. From their characters the author was inclined to associate them with the jaw known as *Phascolotherium*, and to believe that they represented a special, probably insectivorous, monotreme type, with indications of marsupial tendencies, such as, on the hypothesis of evolution, might well be expected to occur early in the development of the Mammalia.

3. "A Review of the British Carboniferous Fenestellidæ." By G. W. Shrubsole, Esq., F.G.S.

In this paper the author gave the results of his investigation of the Fenestellidæ from the upper beds of the Carboniferous Limestone on Halkin Mountain, in Flintshire. He stated that the described Carboniferous species of *Fenestella* now number 24, of which he has been able to examine 19, and finds that they have been needlessly multiplied, owing especially to the neglect on the part of describers to allow for difference in the structure at various stages of growth and in different parts of the polyzoarium. His investigations led him to refer the forms known to him to only 5 species, namely, *Fenestella plebeia*, M'Coy, *F. crassa*, M'Coy, *F. polyporata*, Phill., *F. nodulosa*, Phill., and *F. membranacea*, Phill.

## MISCELLANEOUS.

*New Observations on the Development and Metamorphoses of the Tapeworms.* By M. P. MEGNIN.

THE author refers to the well-known investigations of Van Beneden, Von Siebold, Leuckart, Küchenmeister, and others, from which it was concluded that the vesicular worms must be swallowed by a carnivorous animal in order to attain their perfect, reproductive, ribbon-like form—and remarks that, while this hypothesis accounted well for the production of the hooked *Tæniæ* of the Carnivores and Omnivores, it did not explain the origin of the unarmed *Tæniæ* of Herbivores, such as the horse, ox, sheep, rabbit, &c., which do not devour any animal capable of harbouring the scoleces of their tapeworms. He finds in horses and rabbits that the vesicular worms (an *Echinococcus* in the case of the horse, *Cysticercus pisiformis* in the rabbit), when they are developed in adventitious cavities in direct communication with the interior of the intestine, resulting from the enlargement of follicles or glands into which the six-

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